

Applicant : Dutt
Appl. No. : 10/599,593
Examiner : Jue S Wang
Docket No. : 703538.4054

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of simulating an instruction set architecture (ISA) with a instruction set simulator (ISS), comprising:
fetching a decoded instruction during a run time, wherein the decoded instruction is decoded from an original instruction in a target application program during a compile time preceding the run time, the decoded instruction pointing to a template configured to implement the functionality of the original instruction, wherein the template is associated with an instruction class that describes a set of instructions of the instruction set architecture having a common behavior, and wherein the original instruction is contained in the instruction class;
determining whether the decoded instruction fetched during a run time is modified from the original instruction; and
executing the template if the decoded instruction was not modified from the original instruction.
2. (Previously Presented) The method of claim 1, further comprising decoding the original instruction by selecting the template corresponding to the original instruction and customizing the template based on the data in original instruction prior to fetching the decoded instruction.
3. (Currently Amended) The method of claim 2, ~~wherein the template corresponds to a first class of one or more instructions and~~ wherein the template has

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a corresponding mask usable to identify instructions belonging to the first instruction class.

4. (Original) The method of claim 3, wherein selecting a template comprises:
comparing the original instruction to the mask corresponding to the template; and
selecting the template if the mask matches the original instruction.
5. (Original) The method of claim 2, wherein customizing the template comprises
determining a value of a parameter in the template based on the data in the original
instruction.
6. (Previously Presented) The method of claim 3, wherein customizing the template
comprises determining a value of a parameter in the template based on the data in
the original instruction.
7. (Original) The method of claim 6, further comprising compiling a first program
comprising the customized template in the compile time.
8. (Original) The method of claim 7, further comprising optimizing the template
during the compile time.
9. (Original) The method of claim 1, further comprising:

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re-decoding the fetched instruction during the run time if the fetched instruction was modified, wherein the re-decoded instruction designates a function configured to implement the functionality of the instruction; and
executing the designated function if the instruction was modified.

10. (Original) The method of claim 1, further comprising executing the modified instruction using an interpretive process.

11. (Original) The method of claim 8, further comprising compiling the target application program to generate the original instruction.

12. (Currently Amended) ~~A system, generic instruction model stored on a computer readable medium, which when read by a processor is for use in a instruction set architecture (ISA) simulator, the generic instruction model comprising:~~
a processor; and
a computer readable medium having stored thereon a generic instruction model, the generic instruction model executable by the processor in an instruction set simulator, the generic instruction model comprising an instruction specification usable to interpret each instruction in an ISA, the instruction specification comprising one or more operation classes;

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wherein each operation class ~~defining~~ defines a set of one or more instructions, the operation class having an operation mask usable to identify instructions belonging to the class; and

~~further~~ wherein the operation class comprises one or more symbols and an expression describing the class in terms of the one or more symbols, each symbol having a corresponding set of one or more symbol types, each symbol type in the set comprising information usable to determine the symbol when compared to an instruction; and

wherein the instruction set simulator is configured to perform

fetching a decoded instruction during a run time, wherein the decoded instruction is decoded from an original instruction in a target application program during a compile time preceding the run time, the decoded instruction pointing to a template configured to implement the functionality of the original instruction, wherein the template is associated with an operation class, and wherein the original instruction is contained in the operation class;

determining whether the decoded instruction fetched during a run time is modified from the original instruction; and

executing the template if the decoded instruction was not modified from the original instruction.

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13. (Currently Amended) The system ~~model~~ of claim 12, wherein the set of instructions has a common behavior and the expression defines the behavior of the class in terms of the one or more symbols.
14. (Currently Amended) The system ~~model~~ of claim 12, wherein one symbol type in the type set is a constant type.
15. (Currently Amended) The system ~~model~~ of claim 14, wherein the type set comprises a plurality of constant types, each constant type having a corresponding type mask usable to determine the constant when compared to an instruction.
16. (Currently Amended) The system ~~model~~ of claim 12, wherein one symbol type in the type set is a register type.
17. (Currently Amended) The system ~~model~~ of claim 16, wherein the register type comprises a register index and a register class.
18. (Currently Amended) The system ~~model~~ of claim 12, wherein one symbol type in the type set is an operation type.

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19. (Currently Amended) The system ~~model~~ of claim 18, wherein the type set comprises a plurality of operation types, each operation type having a corresponding type mask usable to determine the operation when compared to an instruction.
20. (Currently Amended) The system ~~model~~ of claim 12, wherein at least one operation class comprises a plurality of expressions, each expression being conditional on data within an instruction.
21. (Currently Amended) The system ~~model~~ of claim 12, wherein each instruction comprises a series of slots, each slot comprising data translatable into an operation.
22. (Currently Amended) The system ~~model~~ of claim 12, wherein each instruction comprises a series of binary data values and the operation mask comprises a series of mask positions wherein each mask position corresponds to one instance of a binary data value.
23. (Currently Amended) The system ~~model~~ of claim 12, wherein each mask position has a value selected from a group comprising: a binary one value, a binary zero value and a do not care value.

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24. (Currently Amended) A computer readable medium having stored thereon a set of instructions executable by a machine to perform operations for simulating an instruction set architecture (ISA), said operations comprising:

fetching a decoded instruction during a run time, wherein the decoded instruction is decoded from an original instruction in a target application program during a compile time preceding the run time, the decoded instruction pointing to a template configured to implement the functionality of the original instruction, wherein the template is associated with an instruction class that describes a set of instructions of the instruction set architecture having a common behavior, and wherein the original instruction is contained in the instruction class;

determining whether the decoded instruction fetched during a run time is modified from the original instruction; and

executing the template if the decoded instruction was not modified from the original instruction.

25. (Original) The computer readable medium of claim 24, wherein the template corresponds to a first class of one or more instructions and wherein the template has a corresponding mask usable to identify instructions belonging to the first class.

26. (Original) The computer readable medium of claim 24, further comprising:

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re-decoding the fetched instruction during the run time if the fetched instruction was modified, wherein the re-decoded instruction designates a function configured to implement the functionality of the instruction; and
executing the designated function if the instruction was modified.

27. (Original) The computer readable medium of claim 24, further comprising
executing the modified instruction using an interpretive process.